detecting entry of a vehicle into the detection area and detecting exit of the vehicle from the detection area based upon changes in the measurement value with respect to a reference value;

determining the speed of the vehicle;

calculating a time after the vehicle exits from the detection area at which the vehicle will not influence the period of the oscillator signal, wherein the time calculation is based upon the vehicle speed and upon a predetermined distance from the detection area;

producing a sample measurement value at the calculated time after vehicle exit from the detection area;

comparing the reference value and the sample measurement value; and

adjusting the reference value based upon the comparison, so as to adapt the vehicle detector to environmental changes.

2. (Amended) The method of claim 1 wherein the calculating the time after the vehicle exits from the detection area further comprises the processor [computer] implemented steps of:

determining a time rate of change of inductance of the inductive sensor;

determining a magnitude of change of inductance; and

calculating vehicle speed based upon a predetermined entry distance and a ratio of the magnitude of change in inductance and the time rate of change.

3. (Amended) The method of claim 1 wherein the step of adjusting the reference value further comprises the processor [computer] implemented step of setting the reference value equal to the sample measurement value if the difference between the reference value and the sample measurement value is greater than a predetermined threshold.

4. (Amended) The method of claim 1 further comprising the processor [computer] implemented step of setting the reference value equal to an average of a plurality of sample measurement values, each measured after a vehicle has exited the detection area.

5. (Amended) A method of checking a reference value used in an inductive sensor vehicle detector having a processor, comprising the processor [computer] implemented steps of:

measuring frequency of an oscillator signal to produce a measurement value which is a function of inductance of the inductive sensor;

indicating presence of a vehicle if a difference between the measurement value and the reference value exceeds a threshold value;

measuring vehicle speed of the vehicle passing through a sensor area associated with the inductive sensor, the vehicle speed measurement based upon a rate of frequency change and a magnitude of frequency change of the oscillator signal caused by the vehicle;

determining a time after the vehicle exits from the sensor area, based upon the vehicle speed and upon a predetermined distance from the sensor area, at which the vehicle will have traveled the predetermined distances from the sensor area so, wherein the predetermined distance is chosen such that the vehicle will have substantially no influence on the frequency of the oscillator signal;

taking a sample measurement of the frequency of the oscillator at the time after the vehicle exits from the sensor area; and

adjusting the reference value based upon the sample measurement, so as to adapt the vehicle detector to environmental changes.

6. (Amended) The method of claim 5 wherein the step of adjusting the reference value comprises the processor [computer] implemented steps of:

determining a difference between a first sample measurement value and the reference value;

adjusting the reference value to the first sample measurement value if a difference between them is greater than a predetermined level;

producing a predetermined number of additional sample measurement values, each after a vehicle has been determined to have completed a pass through the detection area;

comparing the sample measurement values to determine whether the measurement values are within a predetermined range;

averaging the sample measurement values to produce an average sample measurement value; and

adjusting the reference value to the average sample measurement value if comparing shows the sample measurement values are within said predetermined range.

7. (Amended) In a vehicle detector having a processor, wherein the vehicle detector [which] senses presence of a vehicle with an inductive sensor, a method of identifying environmental changes which affect the vehicle detector, comprising the processor [computer] implemented steps of:

measuring inductance of a dummy sensor which is unaffected by the presence of a vehicle;

comparing a currently measured inductance of the dummy sensor to a previously measured inductance of the dummy sensor; and

determining, based upon the comparison of the currently and previously measured dummy sensor inductances, a change therebetween; [, and since the inductance thereof is unaffected by vehicles, recognizing the change as due to temperature or humidity]

identifying, based on the change between the currently and previously measured dummy sensor inductances, environmental changes which affect the vehicle detector.

8. (Amended) In a vehicle detector having a processor and [of a type] in which an inductive sensor changes inductance in response to a vehicle, and in which an oscillator is connected to the inductive sensor to produce an oscillator signal having a frequency which is a function of inductance of the inductive sensor, a method of identifying a cause of changes in the oscillator signal frequency which are not caused by presence of a vehicle, the method comprising the processor [computer] implemented steps of:

connecting the oscillator to a dummy sensor having an inductance which is not affected by vehicles;

measuring the frequency of an oscillator signal while the oscillator is connected to the dummy sensor;

comparing the frequency measured to a previously measured frequency of the dummy sensor; and

determining, based upon the comparing, a change in the measured frequency; [, and since the inductance of the dummy sensor is not affected by vehicles, recognizing the frequency change as indicative of a change not caused by a vehicle]

identifying, based on the change in measured frequency, environmental changes which affect the vehicle detector.

9. (Amended) In a vehicle detector having a processor and [of a type] in which a first threshold rate of change in inductance of an inductive sensor indicates vehicle presence, a method of identifying changes in the inductance of the inductive sensor caused by mechanical difficulties rather than by a vehicle, the method comprising the processor [computer] implemented steps of:

setting a second threshold rate of change in inductance of the inductive sensor that is indicative of mechanical difficulties, wherein the second threshold rate of change is greater than the first threshold rate of change;

measuring the inductance of the inductive sensor over a plurality of measurement frame segments;

calculating a time rate of change of inductance of the inductive sensor; and

identifying [existence of] mechanical difficulties with the vehicle detector when the time rate of change of inductance calculated is at least equal to the second threshold rate of change.

10. (Amended) In an inductive sensor system having a processor and in which an inductive sensor is connected to an oscillator to produce an oscillator signal having a frequency which is a function of inductance of the inductive sensor, a method of identifying changes in frequency of the oscillator signal which are not produced in normal operation, and are caused by mechanical difficulties which require maintenance

activity to correct, the method comprising the processor [computer] implemented steps of:

measuring a change in frequency of the oscillator signal over each of a plurality of measurement frame segments;

calculating a rate of frequency change dF/dt of the oscillator signal over the plurality of measurement frame segments;

determining whether the rate of frequency change dF/dt corresponds to a rate which does not occur during normal operations, and is, therefore, indicative of mechanical difficulties; and

providing a signal indicating existence of mechanical difficulties.

11. (Amended) A method of adjusting a reference value of a vehicle detector having a processor and which compares a measured value derived from an inductive sensor to a reference value, the method comprising the processor [computer] implemented steps of:

calculating a plurality of measurement periods;

measuring a change in the measured value during each of said plurality of measurement periods;

comparing the change in each said measured value to a threshold change; and

producing a new reference value based upon an average change in said measured values and the threshold change, so as to adapt the vehicle detector to drift in the measured value.

12. (Amended) The method of claim 11 wherein the step of producing a new reference value further comprises the processor [computer] implemented step of adding the average change in the measured values to the reference value if the average change in the measured values is less than the threshold change.

13. (Amended) In a vehicle detector having a processor and in which an inductive sensor is connected to an oscillator to produce an oscillator signal having a frequency which is a function of inductance of the inductive sensor, and in which presence of a vehicle is determined by comparing a measurement value which is a function of oscillator signal frequency to a reference value; a method of adjusting the reference value of a vehicle detector to compensate for drift in oscillator frequency, the method comprising the processor [computer] implemented steps of:

estimating maximum drift rates in the measurement values caused by the inductive sensor and vehicle detector components as a fraction of an oscillator period during a maximum time period;

measuring a change in the measurement value during a maximum time period;

comparing the change in the measurement value to a threshold change in value; and

producing a new reference value, if the change in the measurement value was less than the threshold change by adding a fraction of the change to the reference value, so as to adapt the vehicle detector to drift in the oscillator frequency.